US 167 (Johnston Street) Corridor Study

Subtitle

presented to

Highway Safety Summit

presented by

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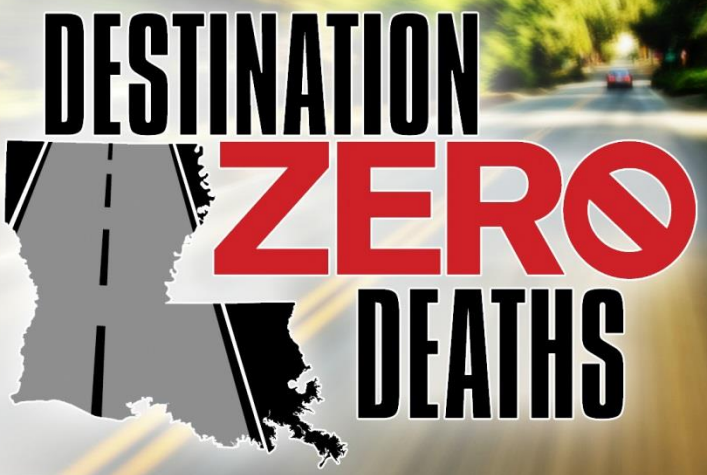


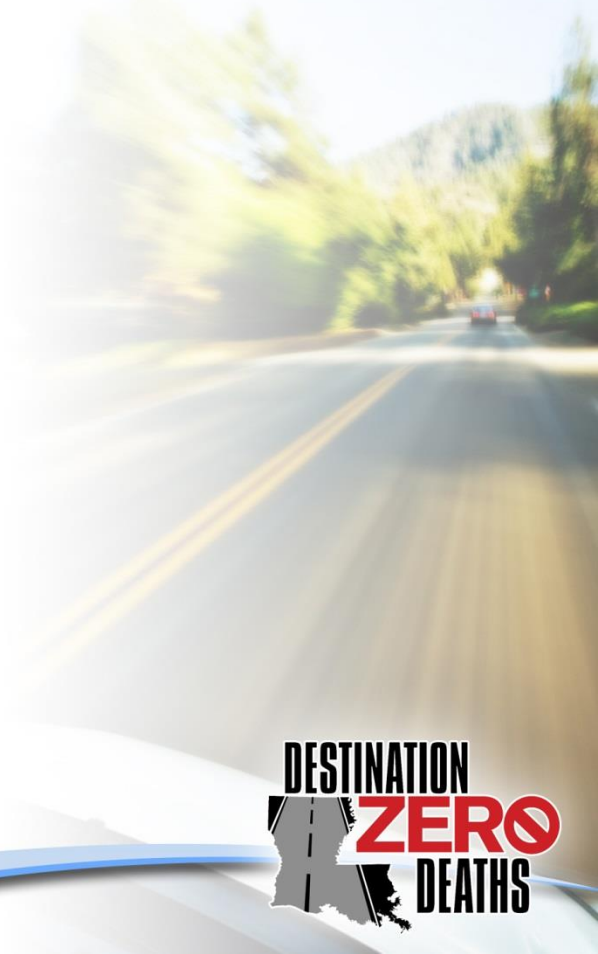
October 20-22, 2015

Project Background

- US 167 (Johnston Street) is one of Lafayette's Major Arterials
- Five-lane Major Arterial through Lafayette
- Traverses through Downtown, ULL, Commercial Areas and the Mall of Acadiana
- Multiple Planning Efforts Over the Last 10 – 15 Years

Initial Planning Efforts
Community Design Workshop

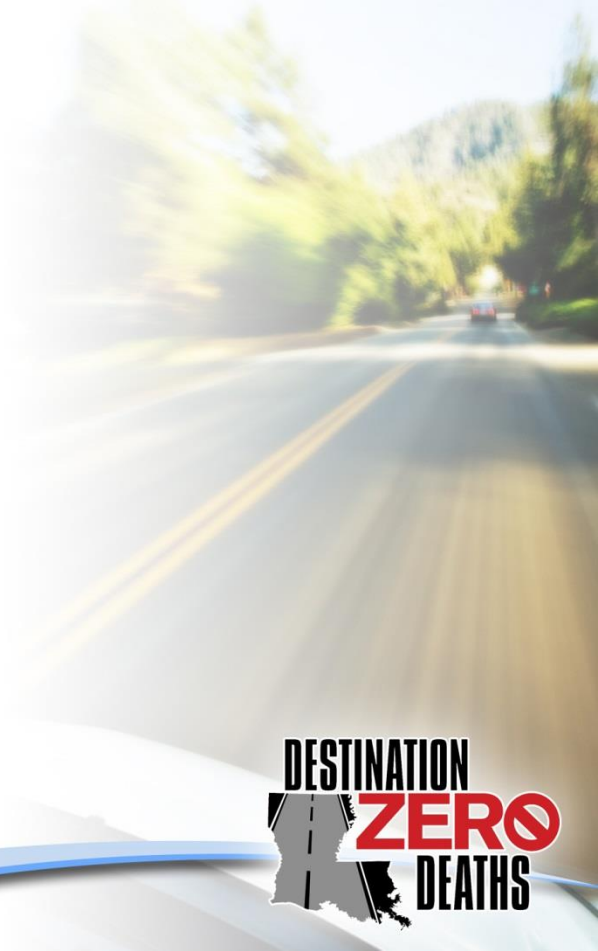
- ULL Architecture Students
- Community Design Charettes
- Development of Design Alternatives
  - » Separate Bus Lanes
  - » Typical Sections Requiring 126’ – 144’ ROW



Conceptual Design
Community Design Workshop

Community Concerns

- Right of Way Requirements
- Impacts on Adjacent Businesses



Current Design Effort

- **Evaluate Design Alternatives**
  - » **Little or No New Right of Way Required**
  - » **Complete Streets Approach**
  - » **Context Sensitive Design**
- **MPO Developed Design Alternative**
- **Discussions with Local, State and Federal Stakeholders**
- **Interest in Safety and Access Management Implications of Project**

EXISTING Roadway

CONCEPTUAL DRAWING FOR PLANNING PURPOSES ONLY

DESTINATION ZERO DEATHS

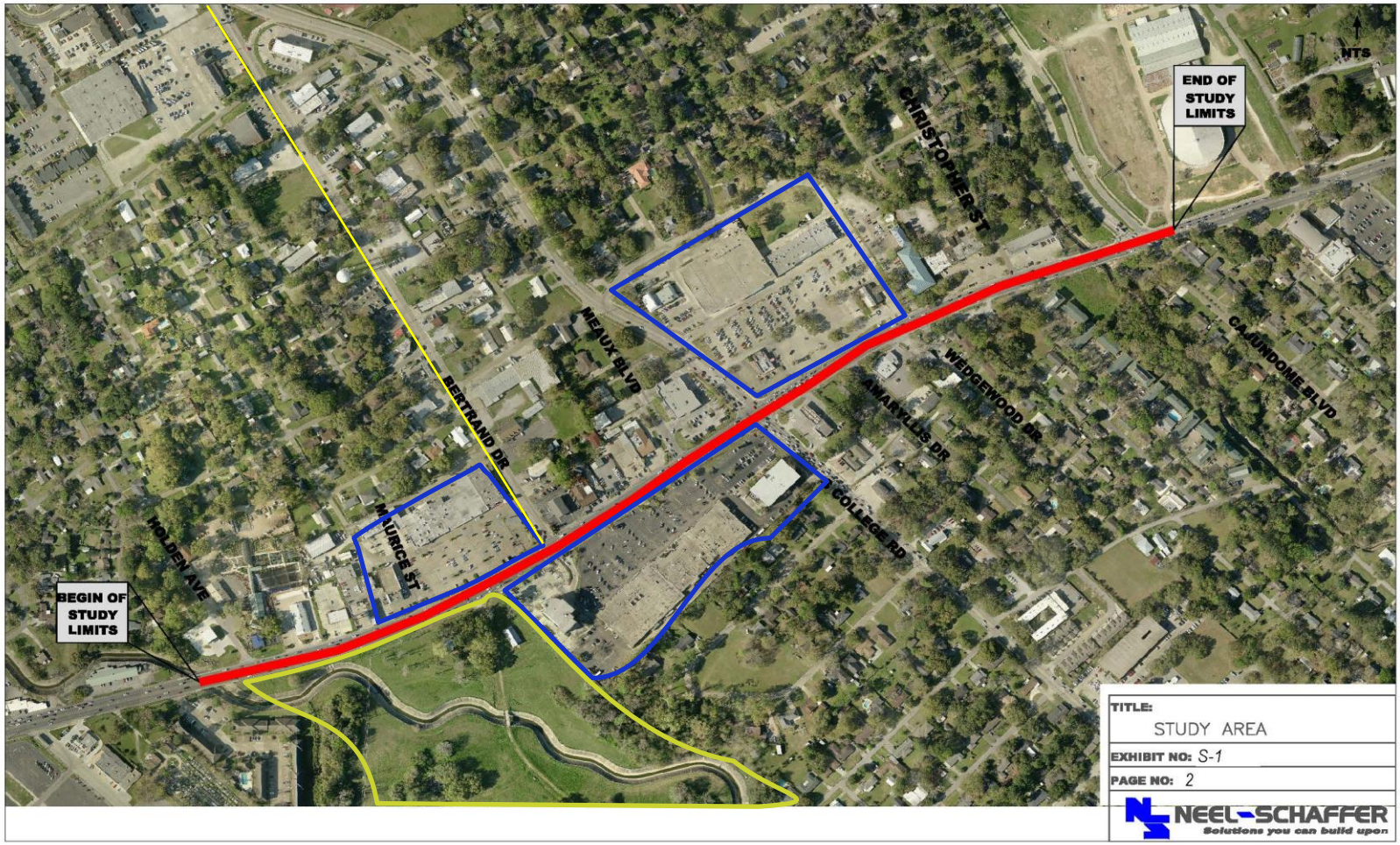
PROPOSED CONCEPT

DESTINATION ZERO DEATHS

Study Area Limits

- US 167 (Johnston Street) 0.8 mi between
  - Coulee Mine bridge, approximately 200 ft west of Holden Avenue
  - Coulee Mine Branch bridge, approximately 100 ft west of Cajundome Boulevard
- Three Major Property Owners Supportive of the Project
- Lafayette Central Park
- Bertrand Streetscape Project
- LCG Comprehensive Plan Small Area Plan
- Lafayette Utility System Study to Bury Utilities

Study Area Limits



Project Purpose and Need

- US 167 (Johnston Street) on LCG's list of corridor transportation improvement projects
- Incorporate Complete Street and Access Management approach in proposed alternatives
- Enhance Safety along the corridor
- Improve efficiency/mobility of traffic flow

EXISTING CONDITIONS

Existing Conditions
Existing Geometry

- **Urban five (5) lane arterial with a center two-way left turn (TWLT) lane with bike lanes adjacent to roadway in both directions**
- **Speed limit 40 MPH**
- **Ten (10) foot wide travel lanes**
- **Three (3) signalized**
- **Six (6) unsignalized intersections**
- **Mixture of commercial, residential, parks and school properties with numerous driveway connections.**

Existing Conditions
Crash Analysis

- **Crash Analysis: years 2009 to 2011**
- **8.30 crashes per mvm compared to Statewide Avg. of 1.74 crashes per mvm.**
- **Overrepresented Crashes**
  - » **Rear End Crashes (56% compared to 37.71%)**

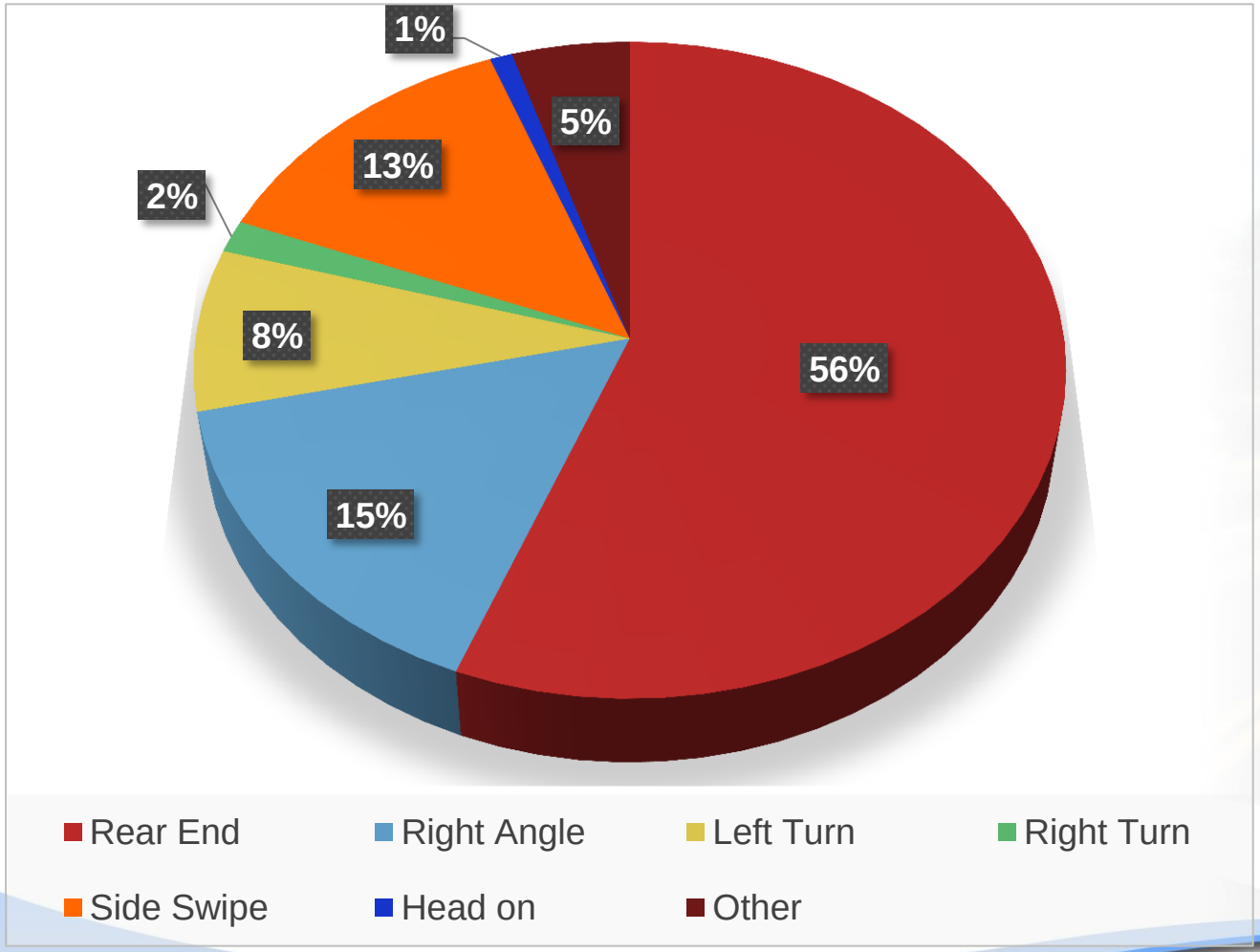
Existing Conditions
Crash Analysis

- **Crash Severity**

Crash Severity	2009	2010	2011	Total
Fatality Crashes	0	0	0	0
Injury Crashes	29	42	29	100 (23%)
Property Damage	117	119	102	338 (77%)
Total	146	161	131	438

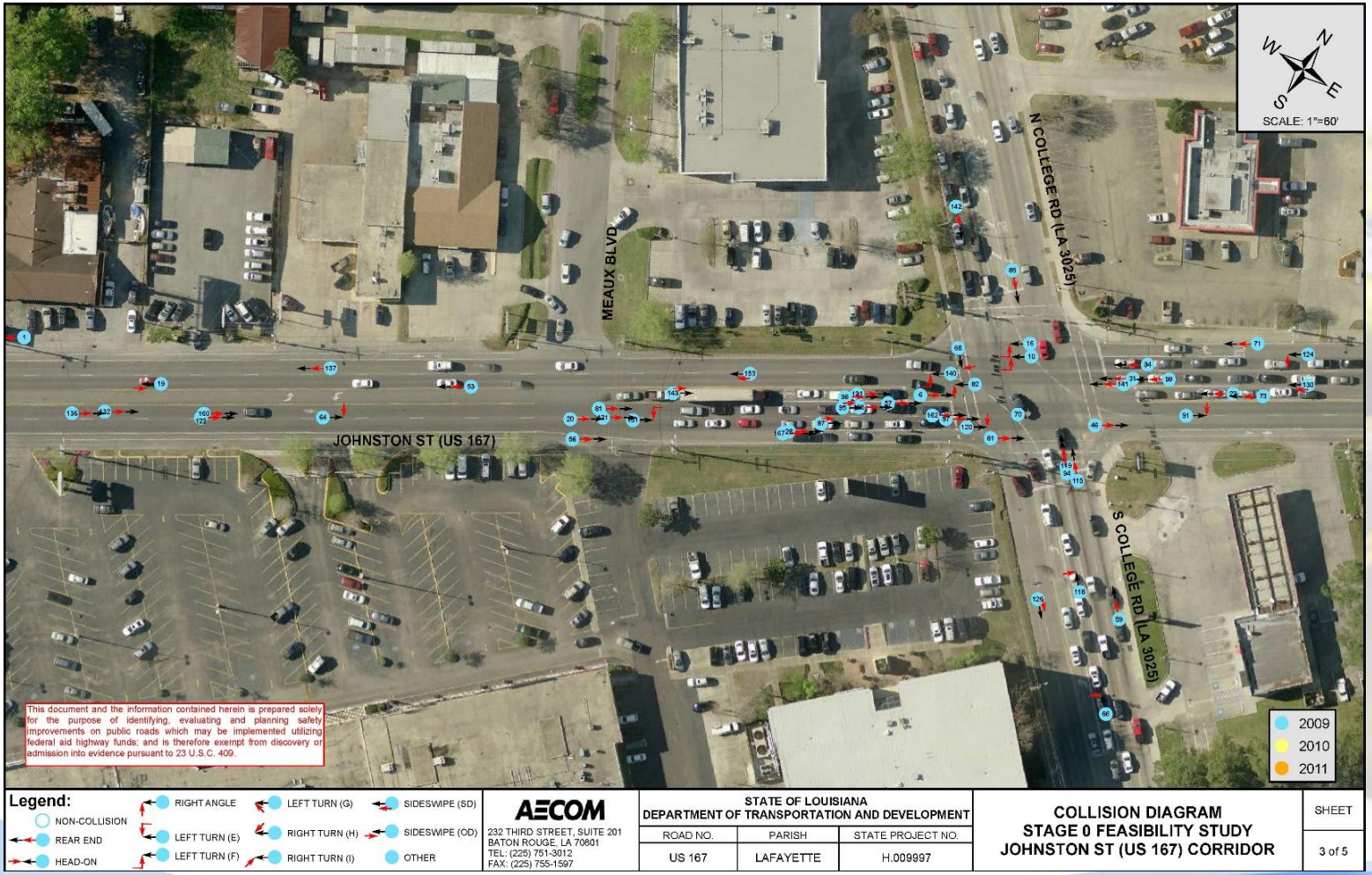
Existing Conditions
Crash Analysis

- **Crash Type**



Existing Conditions
Crash Analysis

- **Sample Collision Diagram**



Existing Conditions
Capacity Analysis

- **ADT is approximately 38,000 vpd**
- **Arterial Existing LOS**

Direction	Level of Service(LOS)		
	AM	MD	PM
Eastbound	C	C	C
Westbound	C	C	C

Existing Conditions
Capacity Analysis

- **Intersection LOS**

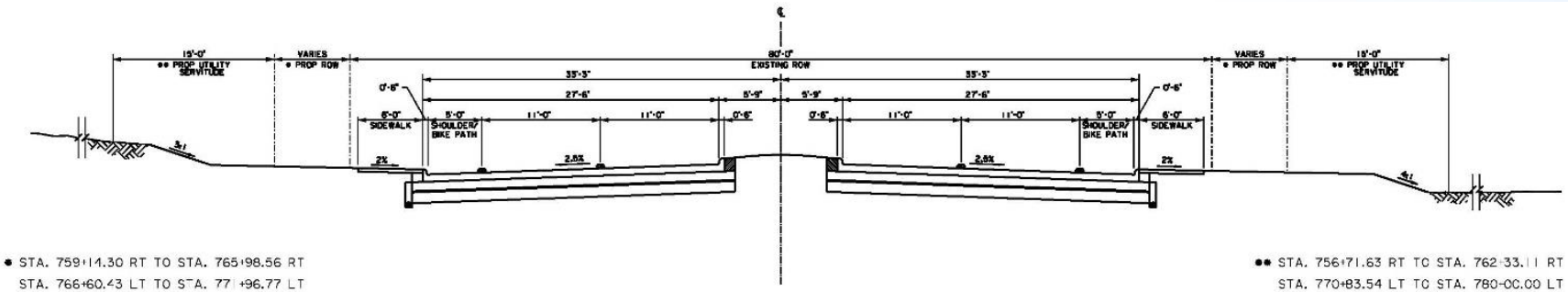
Peak Hour	US 167 (Johnston St) at		
	Bertrand Drive	Cajundome Blvd	S College Road
AM Peak	B	C	B
Noon Peak	B	C	B
PM Peak	B	D	C

PROPOSED ALTERNATIVES

Alternative 1
Description

- Converts five (5) lane section to a four (4) lane boulevard with a raised median
- Lane widths increase from 10’ to 11’
- 6’ sidewalk adjacent to curb of roadway
- 5’ dedicated bike lane in both directions
- Turn lane modifications at two (2) signalized intersections

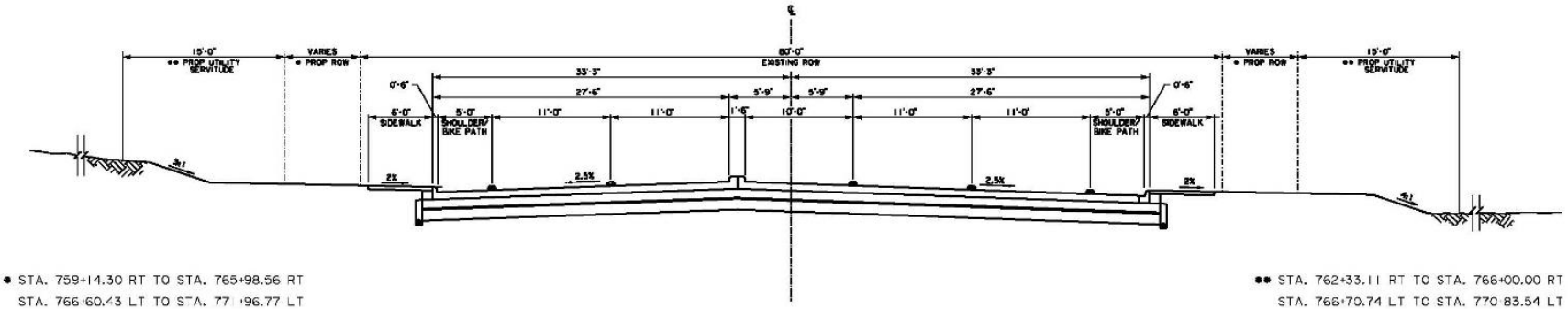
Alternative 1
Typical Section



* STA. 759+14.30 RT TO STA. 765+98.56 RT
STA. 766+60.43 LT TO STA. 771+96.77 LT

** STA. 756+71.63 RT TO STA. 762+33.11 RT
STA. 770+83.54 LT TO STA. 780+00.00 LT

UA-2 4 LANE DIVIDED ROADWAY - CURB AND GUTTER
ALTERNATE 1 - WITH MEDIAN



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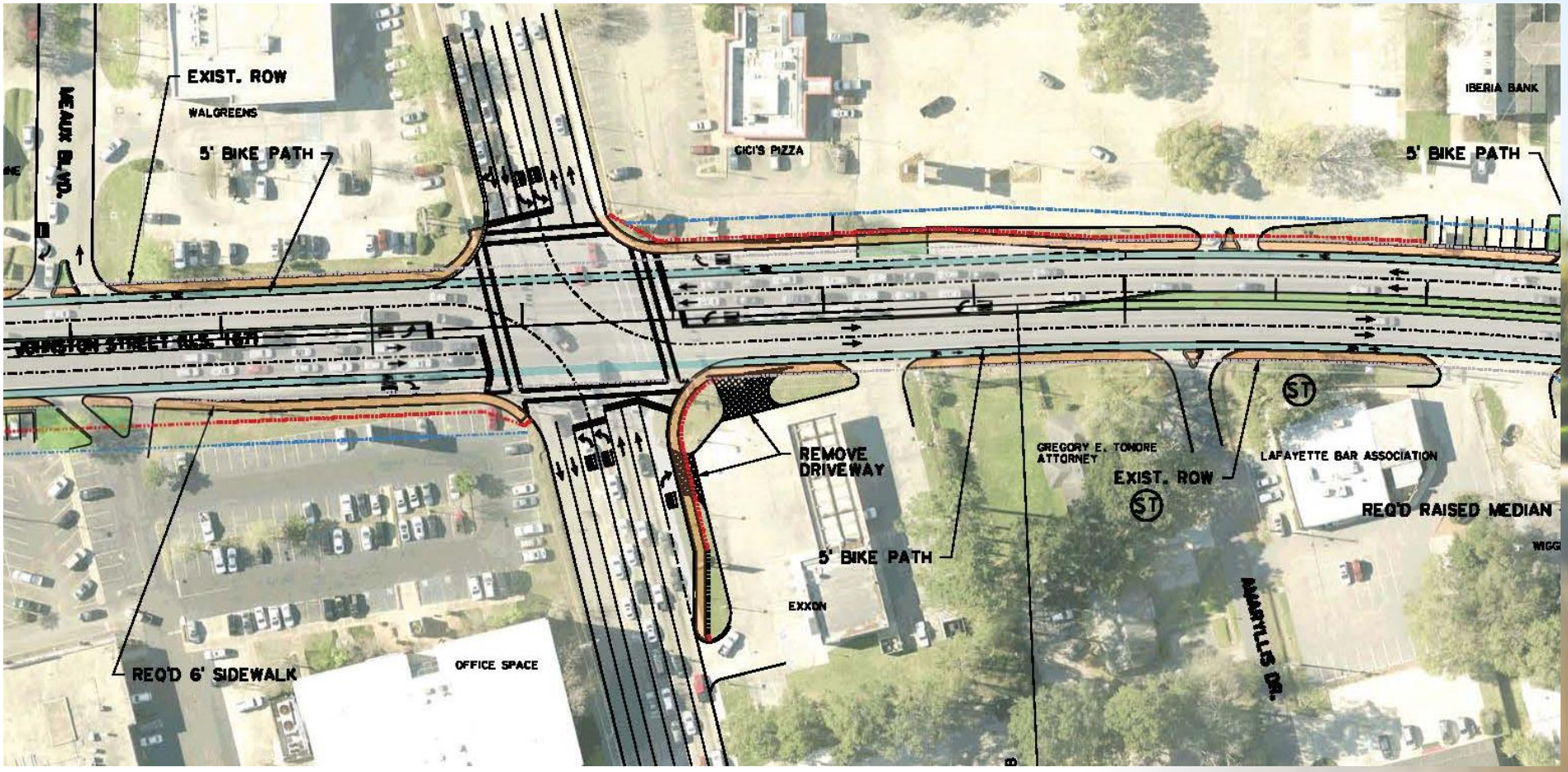
STA. 766+60.43 LT TO STA. 771+96.77 LT

** STA. 762+33.11 RT TO STA. 766+00.00 RT
STA. 766+70.74 LT TO STA. 770+83.54 LT

UA-2 4 LANE DIVIDED ROADWAY - CURB AND GUTTER
ALTERNATE 1 - WITH LEFT TURN

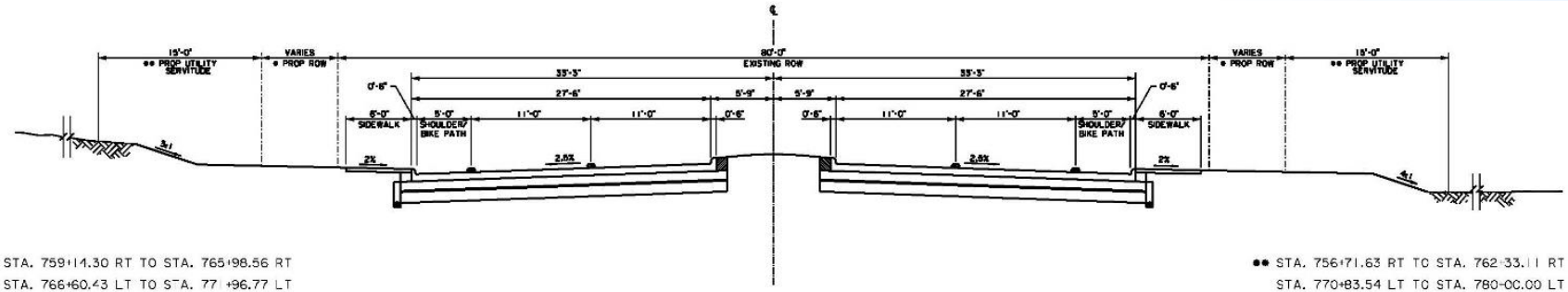
Alternative 1
Concept Layout



Alternative 2
Description

- **Converts five (5) lane section to a four (4) lane boulevard with a raised median**
- **Lane widths increase from 10’ to 11’**
- **6’ sidewalk adjacent to curb of roadway**
- **5’ dedicated bike lane in both directions**
- **Turn lane modifications to two (2) signalized intersections**
- **Partial Reduced Phased Intersection (RPI) at the intersection of US 167 at S College Rd**

Alternative 2
Typical Section



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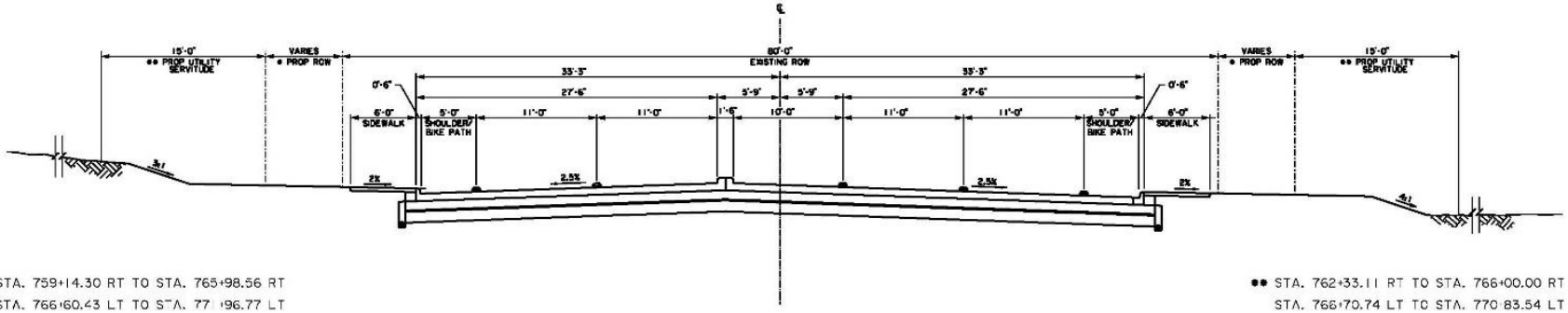
UA-2 4 LANE DIVIDED ROADWAY - CURB AND GUTTER
ALTERNATE 1 - WITH MEDIAN



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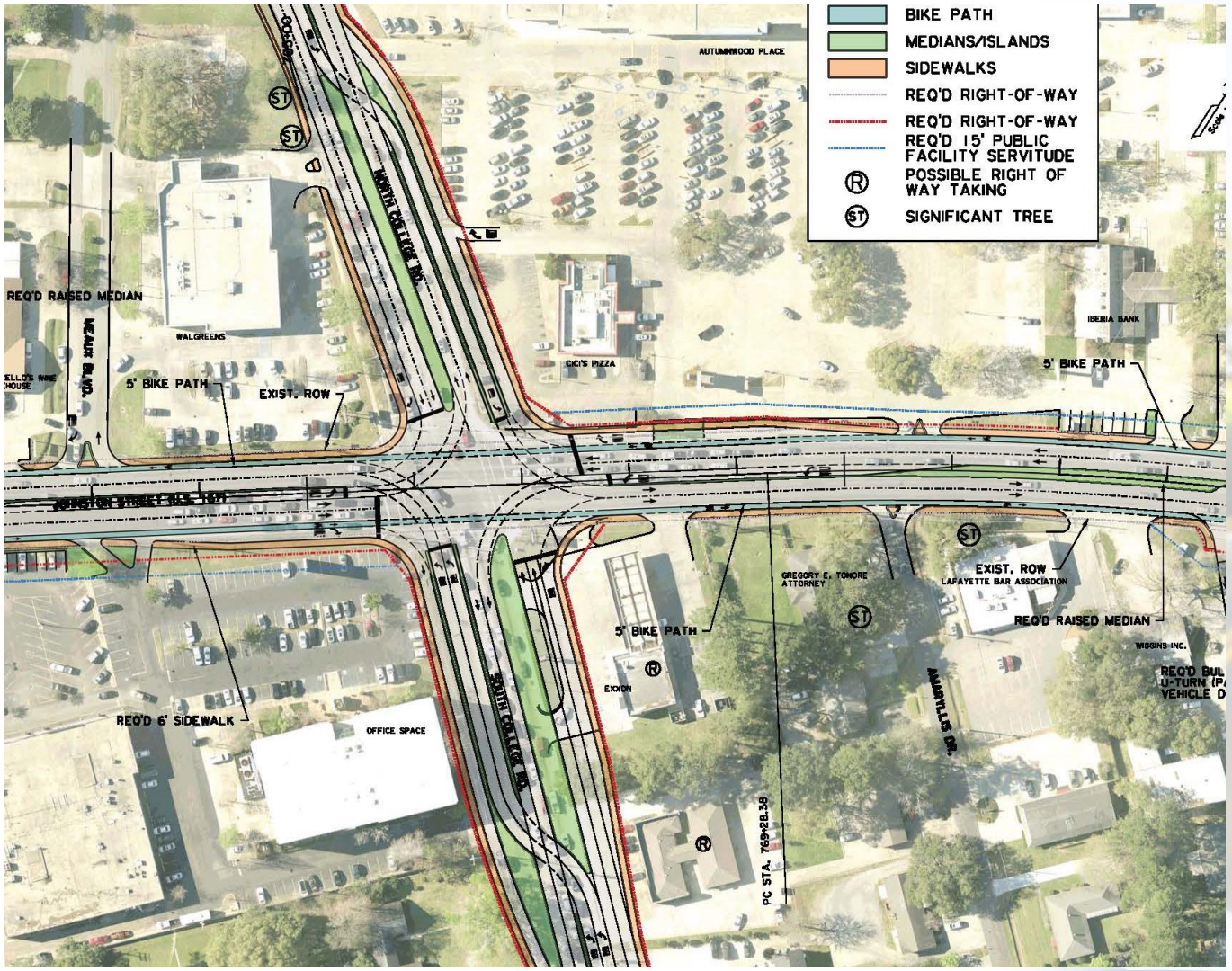
STA. 768+70.74 LT TO STA. 770+83.54 LT

UA-2 4 LANE DIVIDED ROADWAY - CURB AND GUTTER
ALTERNATE 1 - WITH LEFT TURN

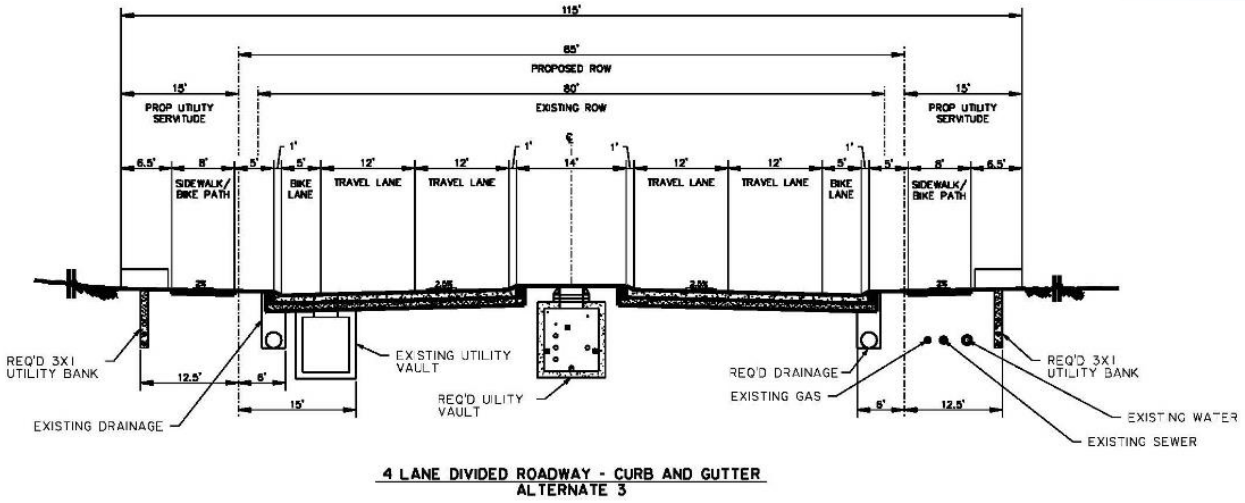
Alternative 2
Concept Layout



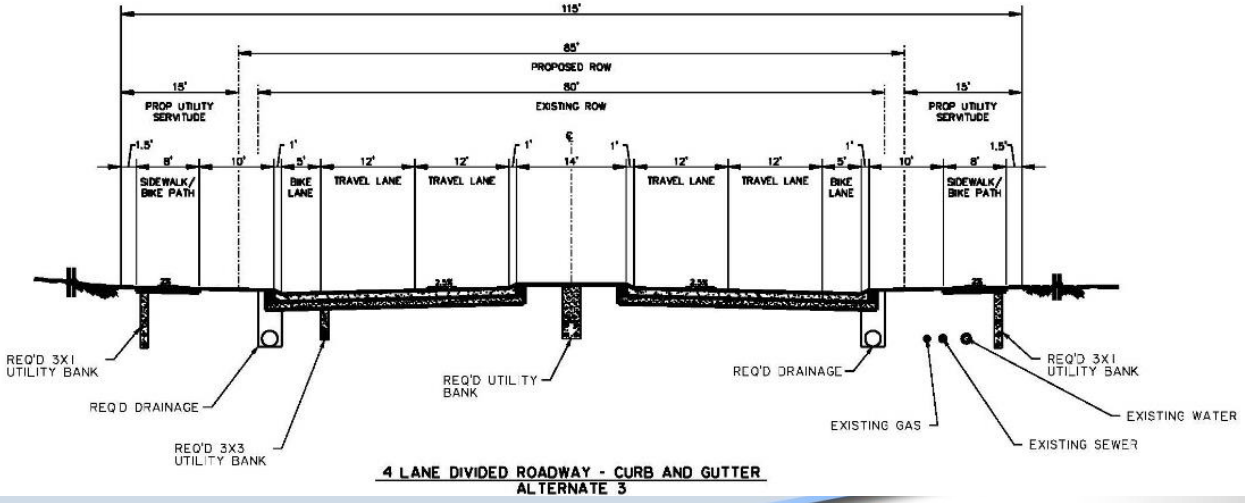
Alternative 3
Description

- **Converts five (5) lane section to a four (4) lane boulevard with a raised median**
- **Lane widths increase from 10’ to 12’**
- **8’ multiuse path**
- **5’ dedicated bike lane in both directions**
- **Turn lane modifications at two (2) signalized intersections**

Alternative 3
Typical Section



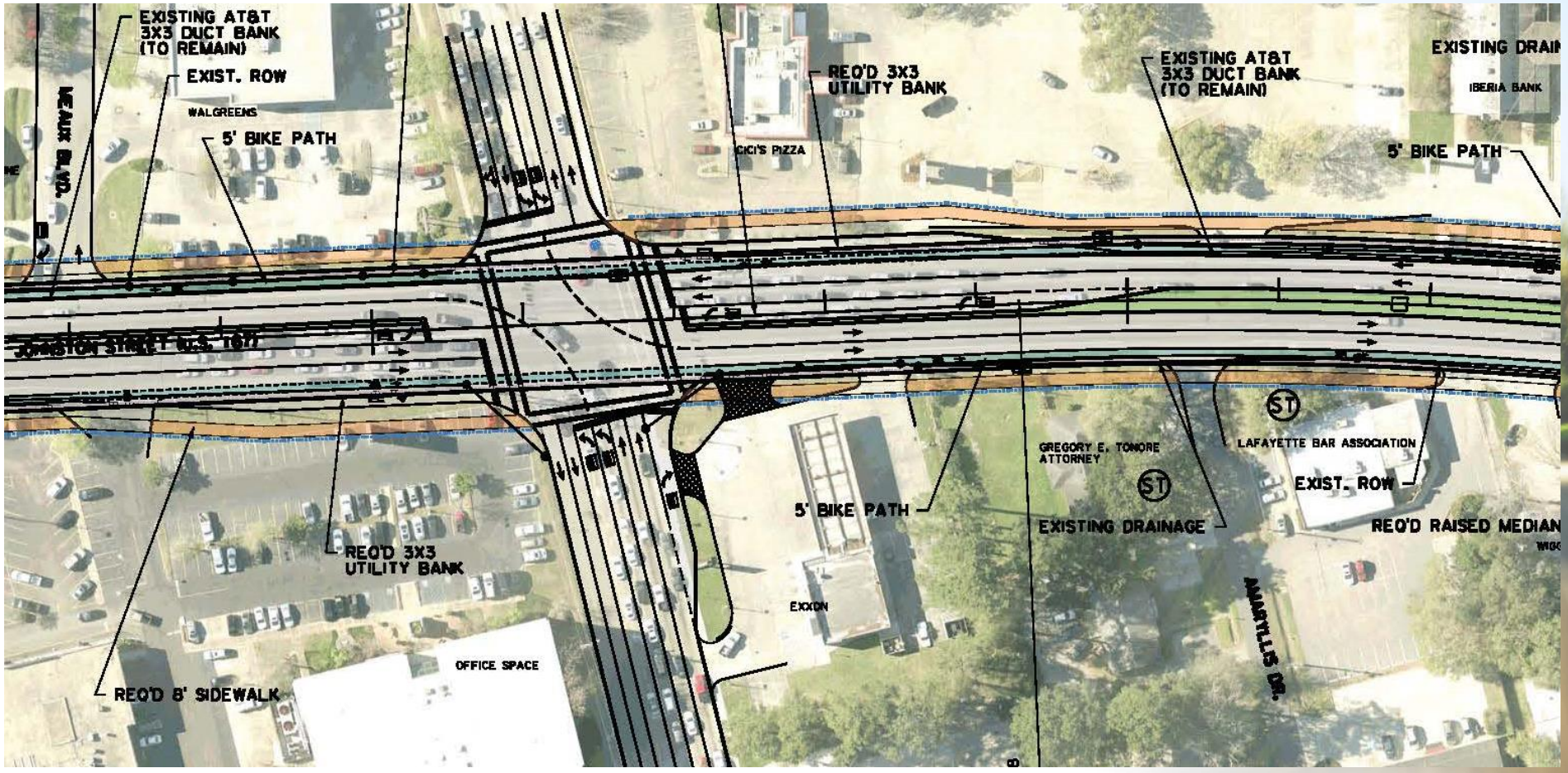
4 LANE DIVIDED ROADWAY - CURB AND GUTTER
ALTERNATE 3



4 LANE DIVIDED ROADWAY - CURB AND GUTTER
ALTERNATE 3

DESTINATION ZERO DEATHS

Alternative 3
Concept Layout



ALTERNATIVES ANALYSIS

Alternatives Crash Analysis

- **Estimated reduction in crashes using Crash Modification Factors (CMF) from "*Highway Safety Manual*" (HSM)**
  - **CMFs considered included**
    - **Raised Median (injury / non injury)**
    - **Lane Width Modification (injury / non injury)**
    - **Modify Access Points (injury)**
    - **Providing a Right Turn Lane on Approach to Intersection (all severities / injury) (intersections only)**
    - **Prohibiting Left Turns (Alt. 3 only / intersection)**
- **Estimated crash benefits for each alternative**

Crash Modification Factor (CMF)

- **CMF used in segment analysis**
  - **For adding raised median: HSM Table 13-11**
    - **CMF for Injury: 0.78**
    - **CMF for Non-Injury: 1.09**
  - **For lane widths modification: HSM Table 13-4 / Eq. 13-3**
    - **CMF for Injury: 0.9598 (10’ to 11’); 0.9569 (10’ to 12’)**
    - **CMF for Non-Injury: 0.9598 (10’ to 11’); 0.9569 (10’ to 12’)**
  - **For Reduced Access Point Density: HSM Table 13-58**
    - **CMF for Injury: 0.71**
    - **CMF for Non-Injury: N/A**

Crash Benefit
Alternative 1

Segment / Intersection Crash Benefit								
	Existing Crashes Per year	CMF #1	CMF #2	CMF #3	Est Crash Reduction (Crashes/yr)	Avg Cost/ Crash Moderate	Avg Cost/ Crash PDO	Est Crash cost Savings per Year
Injury	9.3	0.78	0.9598	0.71	5	$164,396	N/A	$841,191
Non-Injury	102	1.09	0.9598	N/A	-5	NA	$3,292	-$16,722
						SEGMENT SUBTOTAL		$824,469
		CMF #4						
Injury (Int.)	7	0.91	N/A	N/A	1	$164,396	N/A	$103,569
						INT. SUBTOTAL		$103,569
						TOTAL CRASH BENEFIT		$928,038

- **CMF #1 - Add Raised Median**
- **CMF #2 - Lane Width Modifications**
- **CMF #3 - Reduced Access Point Density**
- **CMF #4 - Add Right Turn Lane at Intersection**

Crash Benefit
Alternative 2

Segment / Intersection Crash Benefit								
	Existing Crashes Per year	CMF#1	CMF#2	CMF#3	Est Crash Reduction (Crashes/yr)	Avg Cost/ Crash Moderate	Avg Cost/ Crash PDO	Est Crash cost Savings per Year
Injury	9.3	0.78	0.9598	0.71	5	$164,396	N/A	$841,191
Non-Injury	102	1.09	0.9598	N/A	-5	NA	$3,292	-$16,722
						SEGMENT SUBTOTAL		$824,469
		CMF#4	CMF#5					
Injury (Int.)	7	0.91			1	$164,396	N/A	$103,569
All Types Int.	6		0.36		4	$164,396	N/A	$662,845
						INT. SUBTOTAL		$766,414
						TOTAL CRASH BENEFIT		$1,590,883

- **CMF #1 - Add Raised Median**
- **CMF #2 - Lane Width Modifications**
- **CMF #3 - Reduced Access Point Density**
- **CMF #4 - Add Right Turn Lane at Intersection**
- **CMF #5 - Prohibit Left Turn at Intersection**

DESTINATION ZERO DEATHS

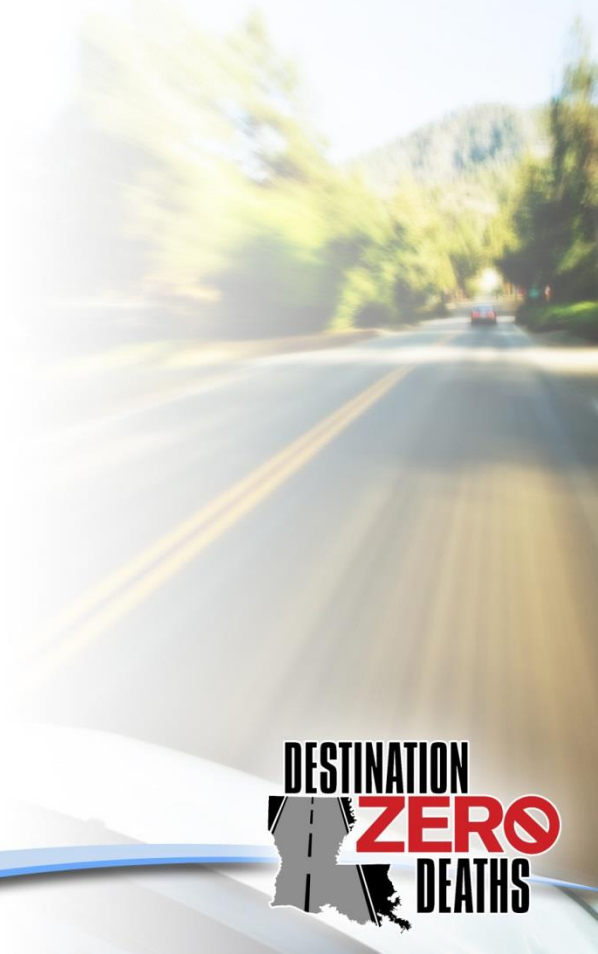
Crash Benefit
Alternative 3

Segment / Intersection Crash Benefit								
	Existing Crashes Per year	CMF#1	CMF#2	CMF#3	Est Crash Reduction (Crashes/yr)	Avg Cost/ Crash Moderate	Avg Cost/ Crash PDO	Est Crash cost Savings per Year
Injury	9.3	0.78	0.9569	0.71	5	$164,396	N/A	$845,625
Non-Injury	102	1.09	0.9569	N/A	-5	N/A	$3,292	-$15,748
						SEGMENT SUBTOTAL		$829,877
		CMF#4						
Injury	7	0.91	N/A	N/A	1	$164,396	N/A	$103,569
						INT. SUBTOTAL		$103,569
						TOTAL CRASH BENEFIT		$933,446

- **CMF #1 - Add Raised Median**
- **CMF #2 - Lane Width Modifications**
- **CMF #3 - Reduced Access Point Density**
- **CMF #4 - Add Right Turn Lane at Intersection**

Capacity Analysis
Arterial LOS

Peak Hour	Alternative	Direction	
		Eastbound	Westbound
AM Peak	Existing	C	C
	Alternative 1,3	C	C
	Alternative 2	C	D
Noon Peak	Existing	C	C
	Alternative 1,3	C	C
	Alternative 2	C	D
PM Peak	Existing	C	C
	Alternative 1,3	C	D
	Alternative 2	C	D



Capacity Analysis
Intersection LOS

Peak Hour	Alternative	US 167 (Johnston St) at		
		Bertrand Drive	Cajundome Blvd	S College Road
AM Peak	Existing	B	B	C
	Alternative 1,3	B	B	D
	Alternative 2	B	C	C
Noon Peak	Existing	B	B	C
	Alternative 1,3	B	B	C
	Alternative 2	C	C	C
PM Peak	Existing	B	C	D
	Alternative 1,3	B	C	D
	Alternative 2	C	C	C

Summary of Alternatives Analysis

US 167/Johnston St feasibility study	Alt. 1	Alt. 2	Alt. 3
Crash Benefit ($/year)	$928,000	$1,591,000	$933,450
Level of Service	D	D	D
Impacts to Adjacent Businesses	Low	High	Moderate
ROW Cost	Low	High	Moderate
Utility Relocate Cost	Low	Moderate	High
Project Cost (Environmental/Design/ROW/Construction Costs)	$12,810,000	$26,275,000	$32,084,000

Moving Forward

- DOTD, LCG, LUS and MPO Review of Stage 0 Study
- Agreement to Move Forward with a Modified Alternative 3
  - » Bury Distribution Lines
  - » Keep Transmission Lines Overhead
- Project Funding with Safety, Access Management and MPO (STP>200K)
- Major Property Owners Supportive of Project
- Finalizing State Entity Agreement